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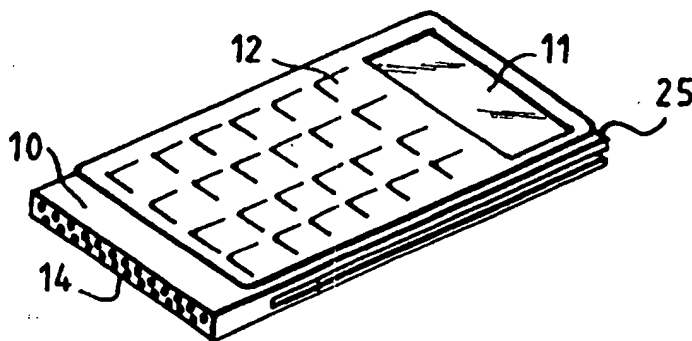
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(54) Title: POCKET VALUE TERMINAL

(57) Abstract

A pocket value terminal comprises a pocketable case (10), a display (11) and a keyboard (12). The case is designed to receive and electrically connect with contact chip cards to carry out various transactions. The case has a multi-pin connector (14) enabling the terminal to be connected to external devices. The central microprocessor may be mounted on a plastic board that also carries a contactless chip. Alternatively, the contactless chip may be mounted on a separate board and held and supported in convenient proximity with the terminal. In this way the terminal acts as a value transfer and communicating device, and can also be used, in contactless mode, to purchase rail journeys and the like.



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POCKET VALUE TERMINAL

The invention relates to a pocket value terminal that is associated with electronic transaction cards that incorporate a memory, frequently known as smart cards or chip cards, and associated hand-held devices.

The cards consist of a thin rectangular section (typically 85.6 mm x 53.98 mm x 0.76 mm) of plastic material into which is imbedded an integrated circuit which contains complex memory and logic circuits, that operate according to various ISO standards and enable the user to conduct a commercial transaction with a service provider. Such integrated circuits are referred hereinafter as "chips".

Various technologies are used for bi-directional communication with the Smart card chips, two of these methods are known as "contact" and "contactless".

Contact chip cards are supplied with contact pads on the surface of the card that are bonded to the chip. It is via a physical electrical connection to these contact pads that communication is accomplished. In contrast, communication to the contactless card chip is achieved

remotely via a radio frequency signal transmitted from an external reader, typically over a distance of around 6 to 10 centimetres. Signals are received via a tuned thin wire aerial in the form of a multi layer loop imbedded in the periphery of the chip card and connected to the chip.

The invention can be applied to any number of chip cards utilising the aforementioned technologies and other associated hand-held devices. Such cards can encompass many applications, typical applications would include, financial transaction cards, stored value cards for transport, telecommunications, car parking meters, identity cards and the like. Such cards are individually prepared and used and, generally stated, comprise a separate card for each function.

A multiple chip requirement could be achieved by developing a combination chip that combines various individual chip function characteristics into a single microprocessor chip. Such a combination leads to extra difficulty with respect to the management protocols of the various functions and in some cases would add greatly to the costs. In terms of mass production or otherwise, it

also involves considerable design expense because for each form of combination a specially designed chip is required.

45 Additionally because of the unproven acceptance level of the individual technologies, many service providers are unwilling to risk the success of their technology by combining with another unproven technology. This is particularly evident in the current integration efforts within the Transport and Financial sectors.

50 Industry observers expect that the migration for service providers from using separate chip cards to a possible final single combination chip card solution would require development through several stages.

Typically these stages would be:

55 Individual cards containing one dedicated chip, to a single card containing two separate chips, to finally a single combination chip combining the features of both technologies.

60 The invention addresses the need for a mechanism to enable service providers to integrate their technologies during the development phases from independent cards to a

possible combination card.

65 By providing a common interface that is both independent  
of the technologies and secure for each of the service  
providers, the long term financial, legal, operational and  
technological concerns related to the integration of their  
services can be addressed.

70 Typical commercial issues with respect to, ownership of  
the card, what powers does the owner have over the data  
stored on any single application, and who is responsible  
for establishing the data structures and security  
mechanisms need evaluation, these and the economic  
benefits from shared ownership can be carefully considered  
75 before committing to the combination chip architecture.

There exists today various hand-held devices in everyday  
use, these may take the form of a pager, mobile  
telephone, calculator, electronic wallet, organiser,  
card value reader, or the like. These devices typically  
80 incorporate features such as, a display, input  
interface, printed circuit board and a processor. The  
cards relating to this invention, and the associated

hand-held devices can be regarded as having their respective communication, memory and processing features concentrated in electronic modules mounted on either plastic cards, or printed circuit boards.

In any event and broadly stated, each of the chip cards relating to this invention can be regarded as a simply suitable encapsulation of a chip and other components as applicable. The encapsulation ensures the integrity of the chip, and its components, and allows such chip cards to be manually handled and, where appropriate, electrically "plugged in" to a device or appliance or simply placed in a slot, e.g. for a financial transaction device inserted in a cash dispenser slot.

Some chip cards are remotely sensed, interrogated and monitored using so-called "contactless technology". Already contactless chip cards are used for railway station entries, road toll collections and electronic driving licenses, for example, where the card is simply "shown" at a distance by a holder or mounted on a vehicle, and automatically communicates with a

stationery reader or monitor.

105 The invention also has application with pagers, mobile  
phones, calculators, electronic wallets, organisers,  
card value readers and the like and may be applied to a  
circuit board that carries one or more chips, and some  
other electrical components where applicable. For the  
110 purposes defining embodiments of the invention, any of  
the chip cards and associated hand-held devices where  
applicable, will be referred to as "pocketable  
communicating devices" to give an indication to their  
size, format and function.

According to the invention there is provided a  
115 combination of two or more different discrete pocketable  
communicating devices each having a respective  
microprocessor chip for performing its discrete  
functions, in which the devices are arranged to be  
physically associated with one another, and one of the  
120 devices is a contactless chip card.

Each device may have a separate chip and a single holder  
or wallet provided to carry the chips physically close



to one another in association with one another.

125 Each device may comprise a separate supporting card of plastic material and a housing arranged to receive and carry the two or more cards physically close to one another.

130 In some of the devices the contactless chip card may be formed or carried on the same plastic card as the other or one of the other devices.

An aerial for the contactless device may be formed by conductors printed on the, or one of the plastic cards of the other devices.

135 One of the devices may comprise a manually operable pocket value terminal incorporating an independent microcomputer. One of the functions of the microcomputer is to communicate directly to one or more pocketable communicating devices, or to enable communications between two or more of these devices, when the devices  
140 are physically placed close to the microcomputer during the communicating.

The pocket value terminal may be arranged to contain a mechanism for receiving and holding at least two chip cards in position. The pocket value terminal preferably includes a facility to communicate to and/or between at least a chip card and the microcomputer, in which case the contact chip card is electrically connected during the communication process by exposed contacts to the pocket value terminal.

The pocket value terminal preferably also has a multi-pin connection connectable to other appliances.

The housing may comprise a wallet arranged to contain the pocket value terminal.

In the combination, one of the devices preferably comprises a commonly used electrical device that fits into a person's pocket.

One of the devices preferably contains a central processor card. The central processor card may be provided with the means for communicating directly to a chip in another card physically placed adjacent the

central microprocessor card during the communicating.

A device may be arranged to contain the central processor and have a mechanisms for receiving and holding other cards with similar chips in position.

165 A chip card value reader may be provided and arranged to display the value residing in the memory of a chip card when physically placed within the device.

A holder or a wallet may be arranged to control and transfer value between various other cards physically placed adjacent the central processor, or into a common  
170 access area within the central processor.

Embodiments of the invention will now be described by way of example with reference to the accompanying  
175 schematic drawings in which:-

Figure 1 is an isometric top view of a pocket value terminal;

Figure 2 shows an isometric top view of a printed

180 circuit board for the device and forming a combined  
central processor and contactless chip;

Figure 3 shows an isometric bottom view of the printed  
circuit board for the device;

Figure 4 shows an isometric bottom view of the terminal;

185 Figure 5 shows an isometric bottom view of an ISO 7816  
type contact chip card;

Figure 6 shows an isometric top view of a Mini or SIM  
type contact chip card;

Figure 7 is a clip-on battery pack for the terminal;

190 Figures 8a and 8b is the pocket value terminal connected  
to a Cellular Telephone handset;

Figure 9 is the pocket value terminal connected to a  
PSTN telephone and modem; and

11

Figure 10 is the pocket value terminal connected to a personal computer.

195 Referring to the drawings, the terminal is provided in  
a laminar shaped pocketable case 10, having an area  
approximately equal to a normal credit card, and  
provided with a liquid crystal display 11 and a keypad  
12. A multiple pin connector 14, mounted at one end of  
200 the case 10 enables the terminal to be electrically  
connected to a flat battery pack 15 which is mounted in  
a container 16 that forms a convenient support or  
mounting for the case 10. Another multiple pin connector  
25 is mounted at the other end of the case 10. The case  
205 10 can also connect to various appliances such as a  
mobile phone, or personal computer. In the latter case,  
the case 10 will connect into a compatible computer  
slot, preferably the 68 pin PCMCIA slot or the RS232  
slot of the personal computer in a normal way. (See  
210 Figure 10.)

In Figure 3, a printed circuit board 17 is mounted with  
a type ISO 7816 contact chip connector 13 and a second

Mini or SIM type contact chip connector 18 into which can be inserted a Mini or SIM contact chip card 19.

215 A microcomputer 24 of the terminal mounted on the printed circuit board 17 enables direct communication with contact chip cards 19 and 22 inserted into the contact chip connectors 18 and 13. In use the chip cards 19 and 22 are programmed to communicate in a totally  
220 secure manner with the terminal according to a known Mondex (trade mark) system, or other similar chip card systems.

In accordance with the embodiments of the invention, a contactless chip circuit is provided and comprises a  
225 separate contactless chip 20 and an aerial 21 mounted and formed on the printed circuit board 17 respectively.

The chip 20 is totally separated from and independent of the microcomputer 24 and the aerial 21 is also electrically isolated from the microcomputer 24.  
230 Indeed, as a matter of convenience to maintain overall versatility, the contactless chip card is preferably formed in a separate manufacturing or assembly operation, before the microcomputer 24 and its

components have been added to the plastic board.  
235 Encapsulation with resin, for example, may however take place after both the microcomputer 24 and the contactless chip 20 have been mounted to the same printed circuit board.

In figure 5, a second contact chip card 22 is shown. The  
240 contact chip card 22 fits in position, opposite the contact chip connector 13, when the card 22 is inserted in between the rear of case 10 and the battery pack 15. According to the Mondex system, the second card 22 may belong to another person, and the arrangement enables,  
245 via a separate communication link between the contact chip cards 19 and 22, and microcomputer 24, transfer of cash values between the cards in accordance with the instructions manually initiated by the keyboard 12 of the terminal. In this way, cash can be transferred,  
250 typically cash for goods and services, between two persons. As mentioned earlier, these arrangements allowing secure transfer of cash values between two chip cards are already known as such.

In terms of embodiments of the invention, the described  
255 arrangement represents a typical example, where the  
contactless chip card is used for example for purchasing  
rail journeys or ticketless flight reservations. The  
user of the described device can carry out transactions  
using a contact chip card, such as obtaining cash at a  
260 cash dispenser or transferring money to another like  
card holder, these value or data transfers can also be  
effected by connecting the pocket value terminal to a  
Cellular Mobile Phone, as shown in Figs 8a and 8b,  
enabling the transfer between the contact card inserted  
265 in the pocket value terminal and the financial  
institution to be completed remotely over the digital  
cellular network.

A typical cellular system would be the Global System for  
Mobile communications (GSM) utilising the Short Message  
270 Service and Over The Air data transfers possible under  
Phase 2+ of the GSM Standard.

The user can also obtain information via the terminal's  
display, relating to the remaining value stored on the  
contact chip card or the most recent transactional data.



275 In addition, in a contactless mode, a holder may also  
obtain information relating to the remaining value  
stored  
on the contactless chip card or the most recent  
transactional data or may enter and leave a railway  
280 station, or board an aircraft without the need for a  
conventional airticket . The contactless chip feature  
may also be devised and used as an identity card for  
entry to a "secure" office, for example.

Additionally, the user, when conducting transactions  
285 with either the contact card or the contactless card  
features of the terminal, can accumulate loyalty points  
that have a predetermined relationship to the value of  
his purchases with either the contact card, or the  
contactless features of the terminal.

290 These points can be converted by the relevant service  
provider into a value format that can be stored in a  
public partition of the microprocessor 24, that is  
accessible by both the contact card service provider and  
the contactless card service provider, and used jointly  
295 or severally by the service providers for distribution

between themselves and/or with the users.

The contactless device in the described embodiment is formed on the same plastic board that support the terminals' electronic components. In other applications the contactless device may be formed on a same printed circuit board that supports pager, mobile telephone, calculator, card value reader, electronic wallet or organiser, electronic components. On the other hand, the contactless device may be quite separate, as well as being also discrete in the manner above, and so simply placed or used in proximity with the chip boards of the other "communicating" devices, which devices include the terminal (as described) that communicates with chip cards such as 19 and 22

In any event it will be appreciated that in embodiments of the invention the contactless function is a kind of "add-on" to a communicating device, such as a pocket value terminal, say. There are at least three advantages with providing such an arrangement. Firstly, there is no need to re-design and technically prove the contact chip or the contactless chip as they are known

and generally available per se. Secondly, several different kinds of contactless chip cards can be selected and added to one of a variety of contact chip  
320 cards. Thirdly, because there are no battery requirements for contactless operation, or generally, the contactless function can be provided next to a standard printed circuit of a pager, a mobile telephone, a calculator, a card value reader, an electronic wallet,  
325 an electronic organiser or other devices. As such, the pager and so forth can be used for its normal function and also used to obtain entry to a railway station using the incorporated or added-on contactless chip card feature.

330 A further advantage of maintaining the chip functions separate is that it maintains privacy and security between the respective service providers and/or users.

It will be noted that the user or holder of the described device may be informed, using the  
335 microcomputer 24, of the status of the value remaining on his chip card and has means of privately obtaining the most recent transactional data relating to his

cards. At present means for accessing this information are generally located at the service provider, and in many cases such information is not easily available.

Instructions relating to all the foregoing can be carried out by the combined use of the display and key input features of the pocket value terminal.

Other variations based on the pocket value terminal can be provided to enhance its overall usefulness. The pocket value terminal may be connected to an information system for the transfer of data and/or value via either of two multipin connectors provided on the terminal. In one arrangement the pocket value terminal may be connected to an information system via the 68 pin PCMCIA connector 14. The information system could be accessed by an appliance such as a personal computer, personal digital assistant, or any other device that contains a connecting slot that is compatible with the terminal's 68 pin PCMCIA connector and associated unique connector alignment profile.

Alternatively the information system may be accessed by means of a telephone network. To achieve this the

terminal is connected to the telephone network via a  
360 telephone handset, which may be a mobile phone or a  
special handset designed for the purpose. The most  
recent of mobile digital telephones are equipped with  
data transfer connection slots, to which the pocket  
value terminal is connected in use by the second multi-  
365 pin connector 25 located on the periphery of the  
terminal, as shown in Fig 8a, the data transfers are  
enabled by integrating proprietry software drivers  
provided by the cellular handset manufacturers into the  
pocket value terminal that are compatible with the  
370 communication protocols of the cellular handset.

Alternatively the pocket value terminal can be connected  
via the 68 pin PCMCIA connector 14 to mobile digital  
telephones that are appearing with PCMCIA compatible  
slots located at the base or side of the cellular  
375 handset as shown in fig 8b.

A similar configuration is possible with a telephone  
handset connected to the Public Switched Telephone  
Network (PSTN) incorporating a modem designed for data  
transfers, as exhibited in Fig 9.

380 In any of these data transfer arrangements the pocket value terminal contributes a significant increase in computing capacity not available to chip cards in their independent state. This increased computing power enables

385 the pocket value terminal to act as an "intelligent" partner to a relatively simple chip card, by performing the functional workload such as implementation of security measures, typically full asymmetric cryptography which demand large computing facilities.

390 A further consideration is the need for the pocket value terminal to have a sufficiently large electrical power source. This is achieved with a large capacity plug-in power pack which may be rechargeable, and is of a format that does not contribute significantly to the terminal's weight or bulk as shown in Figure 7, connection to the  
395 pocket value terminal may be via the 68 pin connector 14.

Additionally, the pocket value terminal, maintains in such a data transfer configuration, the feature  
400 available in previous embodiments, of being able to

accommodate several chip cards simultaneously, and to be able to communicate to or between the inserted chip cards and the information systems. This can result in the transfer of value via the communication system, typically between a chip card and a financial institution. The remaining value residing on the chip card can be read from the terminal's display, prior to the removal of the card from the pocket value terminal, and the card then used in a normal transactional manner.

In a further embodiment the pocket value terminal is used

in a communication system connectable to an interactive market, or similar virtual network. This may be via the previously described transmission systems or by mass market devices, specially designed for this interactive medium. Such devices include TV set-top boxes and Internet connecting devices. By connecting the pocket value terminal to these devices, small value payments can be transferred instantaneously from the inserted chip card for services such as pay to view movies, or specially televised sporting events. It is also possible to use the pocket value terminal for payments over the

Internet for a multitude of goods and services that are and will be available from this medium. Typically the majority of payments via these networks are 'micro-payments', being of small value and not economically transacted by conventional credit card means due to the relative high cost of the associated transaction accountability.

Instructions relating to all the foregoing connections with the communicating systems can be carried out by the combined use of the display and key input features of the pocket value terminal or the computer terminal, telephone or other connected device.

Computers and digital technology have opened new markets that require secure and swift remote payment arrangements.

Remote payments need high-levels of security to guarantee protection against counterfeit and fraud, against criminals or computer hackers, who would seek to intercept or divert value transfers between legitimate parties. It is obvious that with the potential for



exponential growth of remote payments via virtual networks, the requirement for improved security is  
445 essential.

In some or most embodiments it is necessary to have a security facility. This is generally an underlying requirement for most users of cash transactions. Advanced card systems use cryptographic safeguards in  
450 conjunction with personal identification of the user. Personal identification systems are generally based on three parameters associated with, something someone knows such-as a personal identification number (PIN), something that someone has, such as a badge or card, or  
455 some biocharacteristic of the individual, such as a fingerprint or speech pattern.

In an embodiment of the invention the pocket value terminal with the plug-in battery pack shown in Figure 7 attached, is provided with a biometric template of the  
460 card user based on his fingerprint, voice or other such data. This template is used to compare real time input of corresponding biometric data from the user, prior to the use of the card. A positive result of this biometric

comparison creates a time based link to the activation  
465 of the value segments of the inserted chip card. After  
removal of the plug-in power pack from the 68 pin  
connector, the pocket value terminal can be inserted  
into a compatible connecting slot in a personal computer  
to complete the value transfer within the designated  
470 period.

Alternatively the pocket value terminal with the plug-in  
powerpack attached can be connected to a compatible  
telephone via the multipin connector 25. The biometric  
475 authentication can be carried out whilst connected to  
the telephone network or independently and then  
connected to the telephone network, as previously  
explained.

In all cases transfers are not possible unless both the  
480 user has been accepted by the biometric authentication  
process, and the user's chip card is inserted into the  
pocket value terminal while the pocket value terminal is  
connected to the PC computer or compatible telephone.  
Removal of the chip card from the pocket value terminal  
485 will terminate the connection.

The action of the biometric authentication together with the unique identifier relating to the integrated circuit of the inserted chip card may also be used to produce a session key for the transaction period selected by the user during the authentication process. This session key further enhances the security that presently exists in some chip card transaction protocols. For each new log-on to the communication system a new session number is generated, and only for the period decided by the user.

Additionally the memory may be expanded for more involved biometrics by storing the biometric template on any of the emerging mini format flash memory card that can be an additional plug-in device to the pocket value terminal.

It will be appreciated that whereas a certain contactless device has been described with a chip mounted on a board and an aerial formed, by printed circuit or other technique, on the board, other contactless arrangements may be used. Such other

505       contactless arrangements included cards that are read  
during proximate inductive coupling where the card is  
normally presented quite closely up to or near a reader.  
In all cases, the contactless device is any device that  
does not actually electrically contact the reader  
510       directly and is a separate or separately operable  
device, as explained in the specification.

CLAIMS

- 515 1. A combination of two or more pocketable different discrete communicating devices and each having a respective microprocessor chip for performing its discrete function, in which the devices are arranged to be physically associated with one another, and one of the devices is a contactless device.
- 520 2. A combination according to claim 1, in which each of the devices has a separate chip and a single holder or wallet is provided to carry the chips physically close to one another in association with one another.
- 525 3. A combination according to claim 1, in which each of the devices is formed on or carried by a respective single printed circuit board.
4. A combination according to any of claims 1 to 3, in which an aerial for the contactless device is formed by conductors printed on the or one of the printed circuit boards.
- 530 5. A combination according to any of claims 1 to 4, in

which one of the devices comprises a commonly used electrical device that fits into a person's pocket.

535 6. A combination according to any of claims 1 to 5, in which one of the devices contains a central microprocessor card.

7. A combination according to any of claims 1 to 6, in which the central microprocessor card is provided with the means for communicating directly to a chip in another card physically placed adjacent the central  
540 microprocessor card during the communicating.

8. A combination according to any of claims 1 to 7, including a device arranged to contain the central microprocessor, the device having mechanisms for receiving and holding other cards with similar chips in  
545 position.

9. A combination according to any of claims 1 to 8, including a device arranged to contain a clip-on rechargeable battery pack, to supply electrical power.

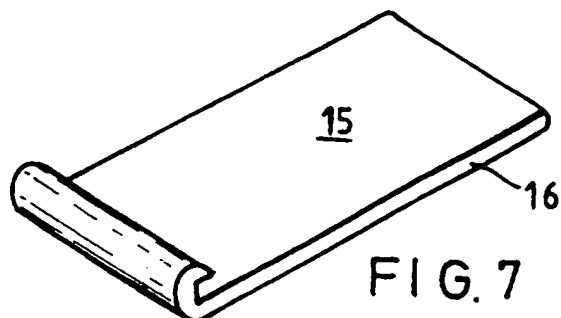
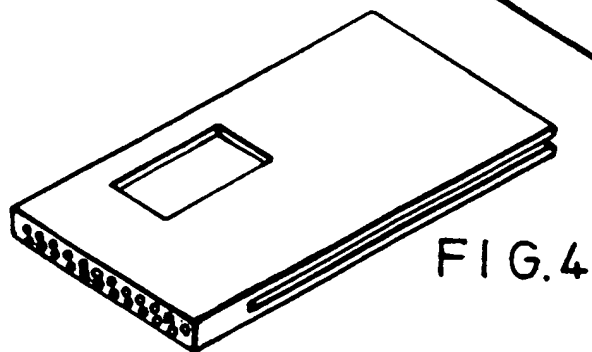
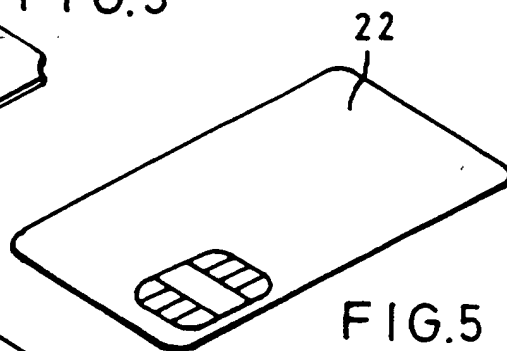
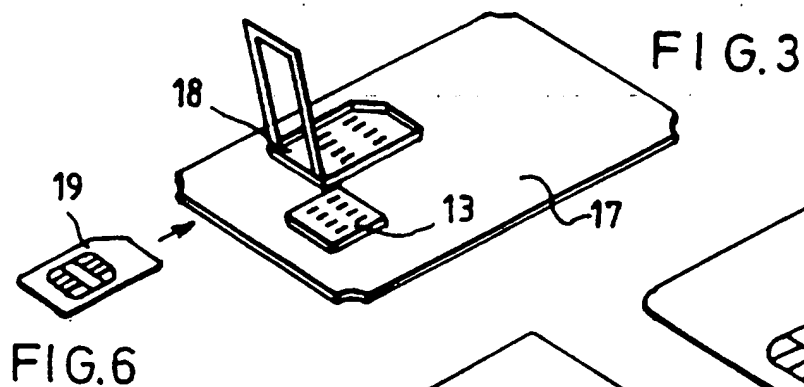
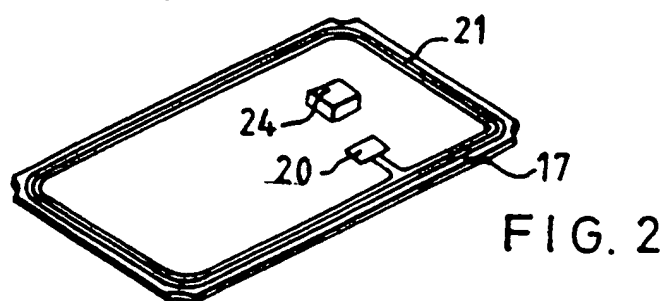
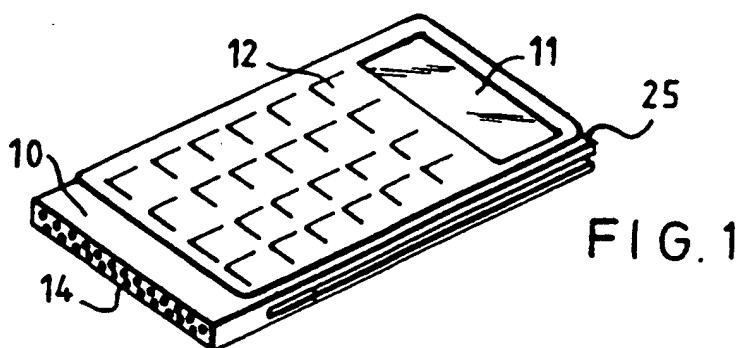
10. A combination according to claim 9, including a  
550 chip card value reader arranged to display the value  
residing in the memory of the chip of a card physically  
placed within the device.

11. A combination according to claim 9, including a  
wallet arranged to transfer loyalty value between  
555 various other cards physically placed adjacent the  
central microprocessor.

12. A combination according to claim 9, including a  
connector that enables connectivity to cellular mobile  
phones to facilitate the transfer of data or value via  
560 the cellular network between financial institutions or  
other card holders to cards physically placed adjacent  
the central processor.

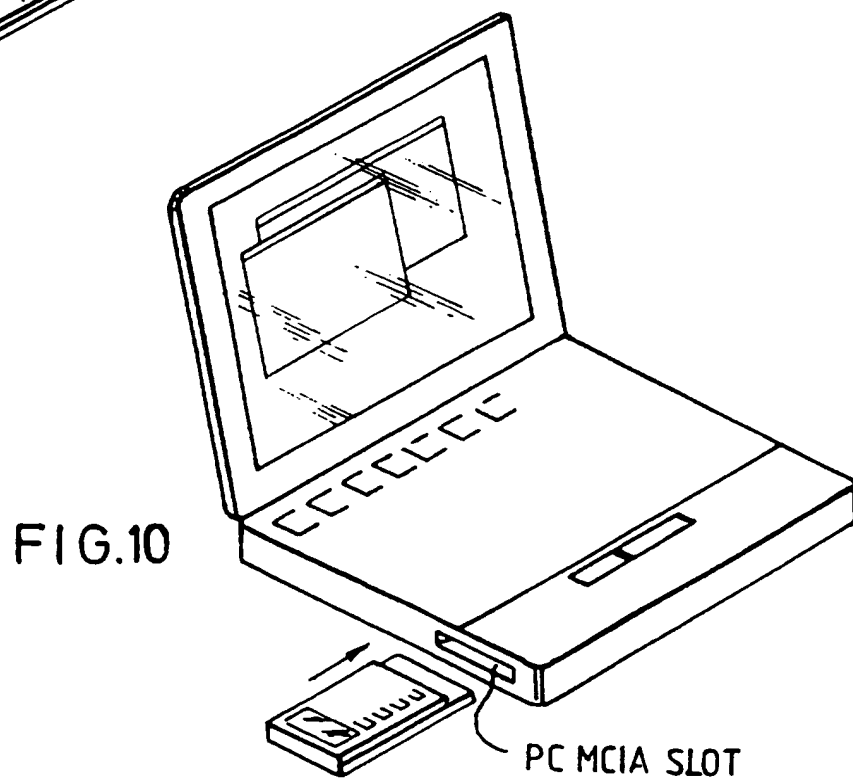
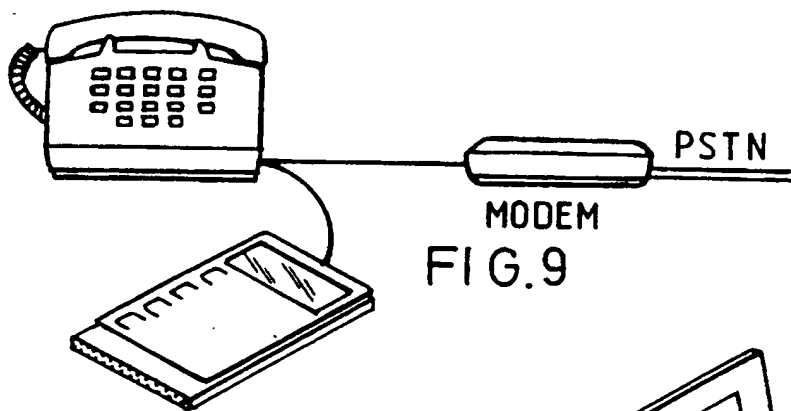
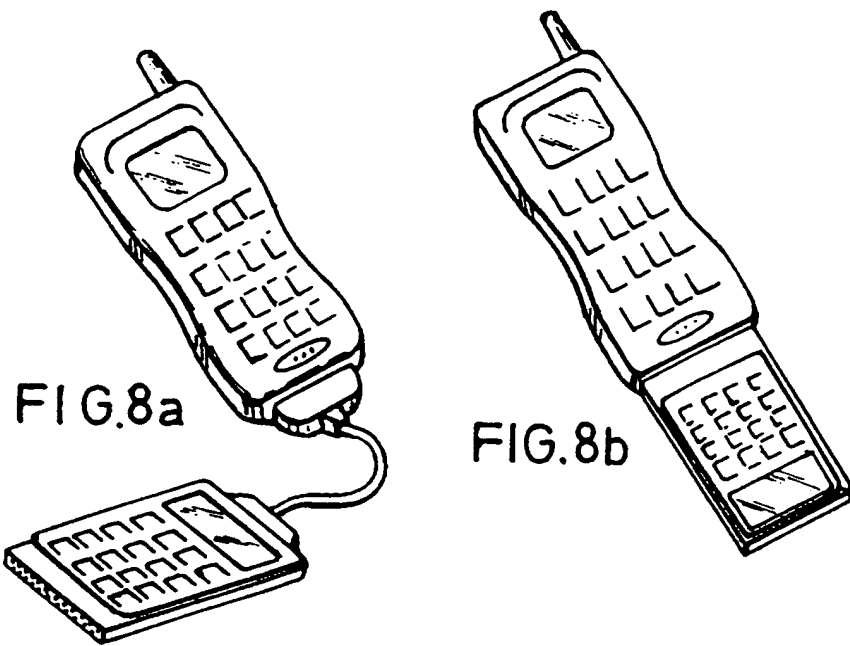
13. A combination according to claim 9, including a  
connector that enables connectivity to personal  
565 computers to facilitate the transfer of data or value  
via the personal computer communication network between  
financial institutions or other card holders to cards  
physically placed adjacent the central processor.

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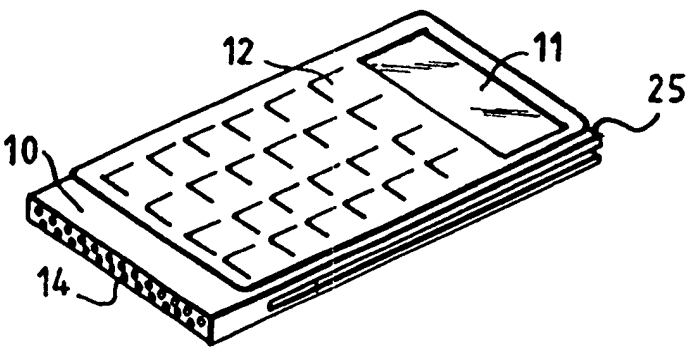
2/2







## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup>:</b>  <b>G07F 7/10, 19/00</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 98/12674</b>  <b>(43) International Publication Date:</b> 26 March 1998 (26.03.98)		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <b>(21) International Application Number:</b> PCT/GB97/02551   <b>(22) International Filing Date:</b> 18 September 1997 (18.09.97)   <b>(30) Priority Data:</b>  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9619708.2</span> <span>20 September 1996 (20.09.96)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9624147.6</span> <span>20 November 1996 (20.11.96)</span> <span>GB</span> </div>   <b>(71) Applicant (for all designated States except US):</b> WAVE HOLDINGS LIMITED [BS/BS]; Offshore Group Chambers, P.O. Box N-341, Nassau, New Providence (BS).   <b>(71) Applicant (for SD only):</b> WHITE, Martin, David [GB/GB]; 57-60 Lincoln's Inn Fields, London WC2A 3LS (GB).   <b>(72) Inventor; and</b>  <b>(75) Inventor/Applicant (for US only):</b> FIELD, John, Desmond [AU/CN]; 97 Nam Wan Street, Peng Chau, Hong Kong (CN).   <b>(74) Agent:</b> WHITE, Martin, David; Marks &amp; Clerk, 57-60 Lincoln's Inn Fields, London WC2A 3LS (GB).         </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).   <b>Published</b>  <i>With international search report.</i>  <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>   <b>(88) Date of publication of the international search report:</b>            23 July 1998 (23.07.98)         </td> </tr> </table>			<b>(21) International Application Number:</b> PCT/GB97/02551  <b>(22) International Filing Date:</b> 18 September 1997 (18.09.97)  <b>(30) Priority Data:</b> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9619708.2</span> <span>20 September 1996 (20.09.96)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9624147.6</span> <span>20 November 1996 (20.11.96)</span> <span>GB</span> </div> <b>(71) Applicant (for all designated States except US):</b> WAVE HOLDINGS LIMITED [BS/BS]; Offshore Group Chambers, P.O. Box N-341, Nassau, New Providence (BS).  <b>(71) Applicant (for SD only):</b> WHITE, Martin, David [GB/GB]; 57-60 Lincoln's Inn Fields, London WC2A 3LS (GB).  <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> FIELD, John, Desmond [AU/CN]; 97 Nam Wan Street, Peng Chau, Hong Kong (CN).  <b>(74) Agent:</b> WHITE, Martin, David; Marks & Clerk, 57-60 Lincoln's Inn Fields, London WC2A 3LS (GB).	<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  <b>(88) Date of publication of the international search report:</b> 23 July 1998 (23.07.98)
<b>(21) International Application Number:</b> PCT/GB97/02551  <b>(22) International Filing Date:</b> 18 September 1997 (18.09.97)  <b>(30) Priority Data:</b> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9619708.2</span> <span>20 September 1996 (20.09.96)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9624147.6</span> <span>20 November 1996 (20.11.96)</span> <span>GB</span> </div> <b>(71) Applicant (for all designated States except US):</b> WAVE HOLDINGS LIMITED [BS/BS]; Offshore Group Chambers, P.O. Box N-341, Nassau, New Providence (BS).  <b>(71) Applicant (for SD only):</b> WHITE, Martin, David [GB/GB]; 57-60 Lincoln's Inn Fields, London WC2A 3LS (GB).  <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> FIELD, John, Desmond [AU/CN]; 97 Nam Wan Street, Peng Chau, Hong Kong (CN).  <b>(74) Agent:</b> WHITE, Martin, David; Marks & Clerk, 57-60 Lincoln's Inn Fields, London WC2A 3LS (GB).	<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  <b>(88) Date of publication of the international search report:</b> 23 July 1998 (23.07.98)			
<b>(54) Title:</b> POCKET VALUE TERMINAL				
<b>(57) Abstract</b>  <p>A pocket value terminal comprises a pocketable case (10), a display (11) and a keyboard (12). The case is designed to receive and electrically connect with contact chip cards to carry out various transactions. The case has a multi-pin connector (14) enabling the terminal to be connected to external devices. The central microprocessor may be mounted on a plastic board that also carries a contactless chip. Alternatively, the contactless chip may be mounted on a separate board and held and supported in convenient proximity with the terminal. In this way the terminal acts as a value transfer and communicating device, and can also be used, in contactless mode, to purchase rail journeys and the like.</p>				
				

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# INTERNATIONAL SEARCH REPORT

Int ional Application No

PCT/GB 97/02551

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G07F7/10 G07F19/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 93 02430 A (HALPERN) 4 February 1993	1-8
Y	see page 3, line 1 - page 4, line 29; figures 1-3,13,14-25B	9
A	see page 7, line 4 - page 17, line 27	10-13
Y	EP 0 670 556 A (GEMPLUS CARD INTERNATIONAL) 6 September 1995 see column 3, line 14 - column 6, line 58; figures 1,2	9
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A	see page 6, line 28 - page 9, line 26; figures 1,2	9-13
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PCT/GB 97/02551

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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